Program for the Field Trip and Workshop on the Martian Highlands and Mojave Desert Analogs

Las Vegas, Nevada, and Barstow, California
October 20–27, 2001

Presentation titles followed by a four-digit number in brackets are supported by an abstract. To view a particular abstract, simply click on the title of that presentation using the hand tool of your Acrobat Reader.

Saturday, October 20, Las Vegas

7:30–9:30 p.m. Registration and icebreaker social

Sunday, October 21

8:30 a.m. Introduction, logistics, and late registration

10:00 a.m. Bus departure from Las Vegas

Field Activities:

- Onboard Bus
  - Introduction to Basin and Range/Mojave Desert geology and structure (Anderson)
  - Introduction to desert surface water and subsurface hydrology (Howard)
  - Lunch
- Tecopa Hot Springs Area
  - Lake bed and tephra deposits (Howard, Moore, and Rice)
  - Erosional History (Howard)
- Death Valley
  - Zabriskie Point and vicinity
    - Deformed alluvial fan, lakebed, and shoreline facies (Whipple)
    - Rainfall-sculpted vertical slopes (Howard)
  - Lake Manly shoreline on Beatty Cutoff Road (Moore, Parker, and Rice)
  - Death Valley dune field (Howard)
- Overnight at Stovepipe Wells

Monday, October 22, Field Trip

Field Activities:

- Death Valley
  - Ventifacts at "Mars Hill" (Laity)
  - Playa deposits (Devil's Golf Course): Origin, chemistry, remote sensing (Farmer) (Supporting abstract by Moersch, Farmer, and Baldridge: *Remote Sensing of Evaporite Minerals in Badwater Basin, Death Valley, at Varying Spatial Scales and in Different Spectral Regions* **[#4023]**)
  - Fan deposits: Fluvial and debris flow processes, tectonic deformation (Whipple)
  - Salt weathering (Moore)
  - Shorelines (Howard and Parker)

- Silver Lake Playa (Howard, Wells, McFadden)

- Arrive at Barstow

Tuesday, October 23, Workshop in Barstow

Session I: Craters and Crater Degradation, Tectonics

Barlow: *Impact Cratering on Mars During the Noachian Period* **[#4005]**

Kereszturi: *Double Craters and Crater Modification* **[#4011]**

Forsythe and Blackwelder: *Evolving Perspectives on the Geologic Evolution of Early Martian Crater Basins* **[#4022]**

Parker and Grant: *Accessing Martian Fluvial and Lacustrine Sediments by Landing in Holden Crater, Margaritifer Sinus* **[#4026]**

Howard: *Degraded Crater Morphology: Fans, Playas and Lakes*

Group Discussion: *Craters, craters everywhere: How can we decipher what they tell us?*

Session II: Fluvial Processes on the Martian Highlands

Carr: *Channels on the Highlands: Recent Research on Their Morphology and Distribution* [Invited]

Irwin and Craddock: *Drainage Basin Integration in the Martian Highlands* **[#4013]**

Aharonson, Zuber, Rothman, Whipple, and Schorghofer: *Topography of Drainage Basins and Channels: Mars and Terrestrial Analogs* **[#4015]**

Burke: *Mojave Desert Stream Beds Resembling Martian Channels* **[#4006]**

Craddock, Irwin, and Howard: *Martian Drainage Densities: Analyses from MOLA Digital Elevation Models* **[#4016]**

Group Discussion: *Sources of water, extent of fluvial erosion and deposition, and climatic implications of valley networks: Have MOC high-resolution images and MOLA topography brought us any closer to a consensus?*

Session III: Regional Studies in the Highlands

Hynek and Phillips: *The Enigmatic Arabia Terra, Mars* **[#4017]**

Mest and Crown: *Fluvial Degradation of the Circum-Hellas Highlands of Mars* **[#4014]**

Anderson and Dohn: *Noachian Faulting: What do Faults Tell Us About the Early Tectonic History of Tharsis?* **[#4024]**

Moore, Howard, and Schenk: *Geomorphic History of the Southern Isidis Rim: Extensive Fluvial Erosion and Possible Deep Oceans*

Group Discussion: *The role of regional studies in deciphering the geologic history and environment of early Mars.*

Session IV: Terrestrial Analogs to the Martian Highlands

Informal discussion and short presentations about possible terrestrial analogs to martian highlands landforms other than the Mojave Desert/Basin and Range

Wednesday, October 24, Sessions at Barstow, Continued

Session V: Rocks, Minerals, and Soils

Catling: *Geochemistry of Sediments on Early Mars* [Invited]

Kirkland, Herr, Salisbury, Keim, Adams, and Hackwell: *Detecting Minerals on Mars Using TES, THEMIS, and Mini-TES* **[#4025]**

Kochemasov: *The Composition of the Martian Highlands as a Factor of Their Effective Uplifting, Destruction and Production of Voluminous Debris* **[#4002]**

Harvey: *The Ferrar Dolerite: An Antarctic Analog for Martian Basaltic Lithologies and Weathering Processes* **[#4012]**

Noreen, Chapman, and Tanaka: *Possible Formation Processes for Martian Crystalline Hematite* **[#4018]**

Group Discussion: *What weathering processes and products would have been produced on Mars under wet and warm versus cold and dry conditions? Where are the carbonates, anyway?*

Session VI: Exploration Techniques and Strategies

Kuhlman et al: *SNOOPY: Student Nanoexperiments for Outreach and Observational Planetary Inquiry* **[#4020]**

Nishiizumi: *Surficial Studies of Mars Using Cosmogenic Nuclides* **[#4009]**

Grant, Schultz, and Campbell: *Exploring the Martian Highlands using a Rover-deployed Ground-penetrating Radar* **[#4008]**

Farr: *Imaging Radar in the Mojave Desert — Death Valley Region* [Invited] **[#4027]**

Group Discussion: *Geomorphic perspectives on desirable instrumentation on space-borne or in-situ Mars exploration.*

Session VII: Eolian Processes

Greeley: *Mojave Desert Eolian Processes: Similarities and Differences with Martian Highlands Eolian Features* [Invited]

Kuhlman, Marshall, Evans, and Luttge: *Australian Red Dune Sand: A Potential Martian Regolith Analog* **[#4021]**

Laity, Bridges, and Boyle: *Ventifact Formation in the Mojave Desert: Field Analogs for Martian Processes* **[#4004]**

Bridges and Laity: *Rock Abrasion and Ventifact Formation on Mars from Field Analog, Theoretical, and Experimental Studies* **[#4003]**

Zimbelman: *Aeolian and Pluvial Features in the Eastern Mojave Desert as Potential Analogs for Features on Mars* **[#4001]**

Group Discussion: *Important issues in the role of eolian processes in the highlands: Abrasion, deflation, deposition, bedforms, sediment budgets, and rates.*

Session VIII: Mojave Desert as an (Imperfect?) Martian Analog

Obviously Mars and the Mojave Desert have many differences today. The modern martian surface is intensely cold and extremely dry, whereas the Mojave Desert can be very hot and sporadically very wet. However, during the time in early Mars history when much of the landscape of the ancient highlands was being shaped, Mars was warmer and wetter, perhaps something like the current conditions in the high Arctic, such as at Devon Island. Thus it is worth asking whether we are seeing alluvial fans, runoff gullies, and even playas and shore traces in the martian highlands, and what components of our terrestrial experience informs us about these ancient martian features. Equally important, how is our terrestrial experience potentially a source of deception in our assessment of the ancient landscapes of Mars?

Open discussion moderated by Bill Dietrich (for terrestrial side) and Alan Howard (for planetary community).

Thursday, October 25, Field Trip

Field Activities:

- Afton Canyon: Lake Manix, shorelines, lakebeds, Mojave River history, and hydrology (Wells)
- Soda Lake
- Pediments along Kelbaker Road (Wells)
- Cima Volcanic field: Weathering and erosional processes on lava flows (McFadden, Wells)
- Kelso Dunes: Transport pathways and sand deposits in the eastern Mojave (Zimbelman)
- Soldier Mountain Sand Ramp and Ventifacts (if time permits) (Zimbelman and Laity)
- Return to Barstow

Friday, October 26, Field Trip

Field Activities:

- Yardangs at Rogers Dry Lake, Edwards Air Force Base (Ward, Laity)
- Searles Lake: Lakebed deposits, shorelines, Trona tufa towers, and Apes (Moore, Howard)
- Return to Barstow

Saturday, October 27

8:00 a.m. Board bus to return to Las Vegas airport

Print-Only Presentations

Rice: *High Latitude Terrestrial Lacustrine and Fluvial Field Analogs for the Martian Highlands* **[#4010]**